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Some Neotropical Species of Syrphids

By F. M. HULL, University of Mississippi

Recent material submitted to the author for study discloses a number of undescribed neotropical flies belonging to the genus *Baccha*. This paper presents the descriptions of these species.

Baccha estrelita n. sp.

A small species without tubercle, the pterostigma without a brown basal spot. Related to *gracilis* Williston. Length 6 mm.

Male. *Head:* vertex and front bright brassy in color, the vertex with several black hairs in front and several yellow hairs behind. The frontal pile is light brownish red. There is a small faintly roughened ridge in the middle of the front and some sparse, yellowish brown pollen on either side. The face is brassy, narrow, barely more narrow below than across the antennae, without tubercle and is sparsely yellowish white pollinose with short yellowish white pile. The antennae are brownish orange, blackish on the dosal third of the third segment; arista blackish. The posterior margin of the occiput lacks a lateral central indentation. *Thorax:* mesonotum, scutellum and pleura deep, bright brassy to golden brown in color, the pile erect and pale yellow, brownish red on the mesopleura, though pale, and on the margin of the scutellum there is a pair of long slender bristles. The mesonotum is quite convex and non-vittate; the squamae and halteres are reddish brown. *Abdomen:* first segment brassy, the second long, slender, subcylindrical, brassy on the sides, rather dull and nearly opaque along the entire dorsal surface except on either side of the base of this segment. This subopaque color is also faintly brassy. Upon the third segment

the basal fourth is light yellowish brown and subtranslucent; the remainder of the segment is dark sepia. Fourth segment with the basal third light yellowish brown and with a quite short, medial, posterior, rounded production from this light colored basal fascia. Remainder of segment brassy sepia. The pile along the sides of the first and second segments is quite long and reddish golden; the pile on the third and fourth segments is shorter, appressed, black on the black areas, yellow on the basal fascia. *Legs:* first two legs entirely brownish yellow. Hind femora elongated and gradually dilated apically, yellowish on the basal half becoming slightly and faintly more brownish apically and with a definite though pale brown subapical annulate band. The hind tibiae are brown, the base, middle and apex light reddish or yellowish brown, the intervening areas scarcely darker; hind tarsi medium brown. *Wings:* uniformly tinged with pale brown; pterostigma dark brown without basal brown spots; alulae narrow but distinct.

Female. In general similar to the male but the front and vertex are bluish in reflection, the sides of the front quite widely pollinose; the stripes of pollen are sharply delimited and clear; face metallic black in ground color. The mesonotum and especially the scutellum are bright, shining blue black; the posterior half of the mesopleura and the anterior half of sternopleura are brownish yellow; remainder of pleura metallic black, perhaps faintly brassy. First and second segments of abdomen bright steel blue, third and fourth segments with basal yellowish brown fascia rather similar to those in the male. The fourth segment of the female does not have any trace of a pale median vitta.

Holotype: a male, Buenos Aires, Trinidad Mts., CUBA, June 1939, C. T. Parsons. *Allotype:* a female and *paratypes* with the same data. Type in the Museum of Comparative Zoology.

Baccha plutonia n. sp.

Related to *trinidadensis* Curran. The pattern and proportions of the abdominal segments are different. Length 8 mm.

Female. *Head:* vertex steel bluish with a single row of black hairs. The front is steel blue in the middle and below, quite polished and somewhat purplish on the upper half with a semicircular spot of white pollen on either side on the eye margins; just in front of the antennal callus there is a deep, transverse, slightly arched crease; the callus is yellowish brown. The face is somewhat bluish black in the middle and faintly and obscurely yellowish brown beside each eye margin just below the prominent tubercle. The antennae and arista are sepia, the third segment a little reddish below. *Thorax:* the mesonotum is dark sepia brown with a pair of scarcely discernible blackish stripes on either side and a short, rather wide, widely separated reddish brown pollinose stripe also on either side of the anterior margin which does not appear to reach even to the transverse suture. The notopleura are sparsely whitish pollinose and the same sparse pollen is continued broadly down the dark reddish brown pleura. The mesonotal pile is erect but sparse and there is perhaps a sparse white collar of pile anteriorly along the mesonotum which is evanescent or denuded in the middle. It appears to be considerably longer than the adjacent pile. The pleural pile is sparse but rather long and light yellow. The scutellum is shining dark sepia brown, the pile on the disk quite sparse but whitish and rather long and erect; the ventral fringe consists of about four long pale hairs. Squamae brownish white with dark brown fringe; halteres with opaque whitish knob. *Abdomen:* quite slender and subcylindrical on the second segment, the first segment and the sides of the second segment sepia with a bluish reflection. The apical fifth of the second segment is reddish sepia with an opaque blackish band just in front and there is an elongate opaque blackish spot in the middle of the segment a short distance from the base. The third segment is considerably expanded apically, dark brown, the basal corners pale brownish yellow scarcely visible except from the sides; the third segment has a large, central, posteriorly, medially indented, opaque brown triangle; fourth segment with a large somewhat oval opaque brown spot on either side in the middle of the segment; fifth and sixth segments dark shining sepia. *Legs:* anterior and middle legs light brown, the base,

apex and a narrow band across the middle of their femora obscurely yellowish, their tibiae brown in the middle, narrowly and obscurely yellow at base and apex, their tarsi yellow. The hind femora is also light brown except at the base, apex and upon a narrow middle band, where it is diffusely yellowish. Hind tibiae widely brown in the middle, the base and apex narrowly yellowish. The hind basitarsi are pale reddish brown on the basal half; remainder of the hind tarsi pale yellow with yellowish pile. The pile of the hind femora and tibiae is almost entirely blackish. *Wings:* with the basal third diffusely tinged with pale brown, the remainder of the wing nearly or quite hyaline; pterostigma pale brownish yellow; alulae well-developed, tinged with brown.

Holotype: a female, Covendo, BOLIVIA, W. N. Mann, 1921. *Paratype:* a female with the same data. *Holotype* in the U. S. National Museum.

Baccha asthenia n. sp.

A small, slender species related to *gracilis* Williston. Pterostigma with a large, dark brown spot at the base, the yellow band of fourth segment without continuing vittae. Length 6 mm.

Male. *Head:* vertex brassy black, the front quite brassy with a minute, medial ridge and a small, low black, tuberculate spot above the antennae. The sides of the front are yellowish grey pollinose, the pile quite long and reddish yellow; the face is without tubercle, is very short and scarcely noticeable in profile and quite brassy in color; it is thinly brownish yellow pollinose with short pale yellow pile. The antennae are short, light brownish orange, the upper third of the third segment dark brown, the arista light brown. *Thorax:* mesonotum very convex, the entire thorax and scutellum very strongly brassy, and non-vittate, the mesonotal pile rather long, erect and reddish yellow. The margin of scutellum has several quite long, fine, reddish hairs; squamae and fringe brown; knob of halteres brown. *Abdomen:* slender on the basal half, the second segment long, slender and quite cylindrical, its sides nearly parallel, the apex barely wider than the middle of the segment and the

immediate base a little wider. The second segment is twelve times as long as its narrowest width. The first segment is brassy black, the second one black and faintly brassy becoming a little more shining on the sides and faintly greenish basally. The third segment has a fascia of brownish yellow occupying the basal fifth of the segment which is complete and entire. Third segment over twice as wide at the apex as at the base; fourth segment rounded, elongate oval, the third and fourth together forming an expanded structure of convex club-shaped appearance. The base of the fourth segment has a wide, complete, brownish yellow fascia occupying nearly a third the length of the segment. The pile upon the sides of the second segment and the first segment is very long and reddish yellow; on the remainder of the abdomen it is short and mostly blackish but yellow upon the light colored fascia. *Legs:* first two pairs of legs entirely yellow, the hind femora long, slender, and brownish yellow and slightly expanded apically and subapically with a wide dark sepia band. The hind tibiae are brownish yellow and brown upon the middle third, the hind tarsi entirely brown. *Wings:* distinctly tinged with brown throughout with a diffuse infuscated spot upon the anterior cross vein and upon the mediocubital cross vein; pterostigma brown with elongate sepia brown spot at its base; alulae present but narrow.

Holotype: a male, Nova Teutonia, BRAZIL, collected by Fritz Plaumann. *Paratypes:* ten males with the same data and collector. The holotype is in the collection of Dr. C. L. Fluke; paratypes in the collections of Dr. Fluke and the author.

Baccha leucopoda n. sp.

A slender, spatulate species with a large brown triangle in the middle of the wing and the base of the wings anteriorly brown. Hind legs black, the hind tarsi white apically. Related to *clarapex* Wiedemann. Length 12 mm.

Female. *Head:* sides of the face broadly and sides of the front narrowly pale yellow. The middle of the face is blackish, the edges diffuse, the tubercle prominent, the sides of the face

strongly narrowed from below in front. The front is widely black with dark brown pollen across the middle on the upper half but white pollinose only on the linear lateral margin. The antennal callus is large, yellowish brown with a large, polished, round, black central spot. The pile of the front and vertex is black, the antennae are black, the arista dark brown. *Thorax:* mesonotum dark sepia brown with strong, brassy reflection sublaterally in which there is a diffuse, obscure, violaceous stripe along the edge; the scutellum is dark brown, a little lighter than the mesonotum and not brassy. The scutellar pile is exceedingly short and sparse, whitish over most of the disc with perhaps a few black hairs, all of it so short as to be scarcely discernible; the ventral fringe consists of about ten pairs of short yellow hairs. *Abdomen:* slender, elongate and spatulate, the first two segments are dark sepia; the second segment has a distinct, elongate black triangle in the middle which is anteriorly truncate. The third segment is sepia brown, very dark, the basal corners laterally yellowish, the large, central, opaque black triangle contains a pair of rather distinct yet diffuse yellowish vittate spots. The fourth segment is similar but a little shorter. The fifth segment is similar but much shorter, and about half as long as the third segment. This segment has scarcely any trace of the yellowish brown in the basal corners. Sixth segment dorso-ventrally flattened, about as long as its width at the base; seventh segment visible and quite short. *Legs:* all of the femora dark brown, nearly black outwardly upon the hind pair; the anterior tibiae are pale yellow on the basal half, diffusely dark brown outwardly; the middle tibiae are similar but only the apical third is dark. The hind tibiae are black and wholly black pilose; anterior basitarsi blackish, the remaining segments light brown; middle tarsi similar, the basal two-thirds of the hind basitarsi black and black pilose, the remainder of these tarsi white and white pilose. *Wings:* nearly hyaline; the apices of the submarginal and marginal cells are faintly smoky. The middle of the wing has a large, sepia brown triangle which is fully as dark as the pterostigma; it includes the end of the anal cell but there are light streaks running towards the base in the

middle of the marginal, first posterior and discal cells which probably represent an aberration. The basal half of the wing is sepia in front but the wing is hyaline behind and there is a nearly hyaline streak in the middle of the second basal cell which is rather wide and which runs almost the full length of the cell.

Holotype: a female, Goyas, BRAZIL. Type in the collection of the author.

Baccha vampyra n. sp.

An ochraceous yellow species, related to *livida* Schiner but the abdomen is wider and has a different pattern. Length about 10 mm.

Female. *Head:* the ocellarium is bicolored; there is a large black oval in front upon which anteriorly lies an ocellus. The posterior part is brownish golden pollinose and the narrow lateral margins of the vertex along the eye and immediately in front of the ocellarium are also golden pollinose. The pile of the vertex is black and lies in a single row. There is a narrow, transverse, brown band on the upper part of the front and a slightly bluish or greenish, prominent, medial, metallic stripe down the upper two-thirds of the front; the remainder of the front except for a protuberant, polished band below lying in front of the callus and set off by a crease, is otherwise ochraceous yellow and subopaque; antennal callus and the lower protuberant area is brownish yellow; the callus has a large, circular, black spot in the middle. The face and cheeks are yellow; the sparse pile is dark reddish brown, the frontal pile is erect, fine and black and not very long. The antennae are a little longer than usual and light orange, the third segment brownish dorsally, the arista orange. The posterior margin of the eye is shallowly concave but is scarcely indented; the occiput is yellow pollinose, the pile long, reddish golden, but not scalose, in a single row with additional irregular pile in the middle at the expanded portion; the upper occipital pile is also yellow. *Thorax:* mesonotum densely brownish ochraceous pollinose; the lateral margins including the humeri and postcalli and the scutellum are widely ochraceous orange but the ground color of the disc and mesonotum beneath

the thick pale pollen is metallic blackish; on the disc there are four slender, metallic black, somewhat brassy vittae, their margins linearly light yellow pollinose; the medial pair are narrowly separated with a slender metallic stripe between which extends to the scutellum. The mesonotal pile is short, fine and yellow; there is a well developed anterior collar of yellow pile; the pleura are polished, reddish ochraceous, becoming paler behind, the lower part of the sternopleura, hypopleura and extreme posterior part of the metapleura are metallic brownish black. The squamae and the stalk of the halteres are light ochraceous, the knob of the latter reddish brown. The scutellar pile is quite sparse but evenly distributed; it is fine and erect and black, the ventral margin with three or four pairs of fine yellow hairs. *Abdomen:* brownish black with numerous, prominent, ochraceous, yellow vittae; the first segment is sepia brown in the middle, yellow laterally with reddish brown pile on the sides; the second segment is much wider posteriorly than basally, the posterior width approximately equal to the length or perhaps slightly greater; this second segment is sepia brown with prominent, slightly arched, transverse band beginning about the middle of the segment, this band does not quite reach the side margin and is bordered with opaque sepia anteriorly and posteriorly. The third segment has three narrowly separated, medial vittae which are slightly wider posteriorly and a still wider sublateral pair which begins to attenuate at the middle of the segment and does not reach the posterior margin; all five vittae are separated at the base of the segment. The fourth segment is similar; the sublateral vittae attenuate posteriorly but reaching the posterior margin; fifth segment with five complete vittae reaching the end of the segment the medial one quite narrow, the two outer vittae on each side gradually and slightly narrowing posteriorly. The abdominal pile is black. *Legs:* first four legs light yellow; the hind femora are yellow with distinct, rather wide, sepia brown band subapically; the pile upon this band and in the middle is brown, the remainder of the femoral pile golden. The hind tibiae are blackish sepia with similar colored pile on all except the basal fourth which is light yellowish orange and orange pilose. The hind tarsi are

wholly light yellowish orange with light golden pile. *Wings:* nearly hyaline at the apex, dilutely yellowish brown in the middle upon the base and the costa and the large alulae; pterostigma yellowish brown.

Holotype: a female, Sao Paulo, BRAZIL, J. Lane. In the collection of the author.

Baccha carmelita n. sp.

A small species with steel bluish thorax, non-tuberculate face and reddish vittae and fascia on the fourth abdominal segment. Related to *gracilis* Williston but with bicolored pterostigma. Length 6.5 mm.

Female. *Head:* vertex and front shining with bluish to bluish green reflections; there is a deep, linear crease on the upper half of the front and on the lower half a slender, somewhat transversely striate, wedge-like triangle; the sides of the front are densely yellowish white pollinose. The face is slightly greenish black, densely yellowish white pollinose with very short white pile. The profile of the face is perfectly straight without tubercle; the pile of front and vertex pale yellow. The antennae are pale orange, narrowly blackish on the dorsal fourth, the third segment flattened and considerably larger than the first and second; arista brownish black. *Thorax:* mesonotum shining, somewhat greenish black but with, on either side, widely separated, there are faintly discernible two bluish vittae; the lateral margins and the notopleura are more brassy; the pleura are slightly brassy. The greater posterior part of the mesopleura, the anterior part of the pteropleura and the wing base are brownish yellow; the pleural pile is yellowish white, the pollen similar. Scutellum strongly shining bluish black with short pale yellow pile and two long marginal bristles. *Abdomen:* the first segment brassy black, the second shining black, long, slender and cylindrical; the third segment is shining brownish black with a small, triangular, yellowish brown spot at the base up on either side; posteriorly this segment is much wider than it is at the base. The fourth segment has a prominent basal fascia of light orange brown which is connected with an almost equally promi-

nent medial vittae of the same color; this vitta is barely wider posteriorly but narrows a little just before it reaches the posterior margin. Fifth segment with a tiny yellowish brown spot on each side at the base. *Legs:* first two pairs pale yellow, the hind femora much longer, rather dilated apically, with wide but pale subapical brown bands; hind tibiae light brown and their tarsi the same color. *Wings:* lightly tinged with brown and distinctly but diffusely more brownish along the apical margin including the margin of the marginal cell and the edge of the wing adjacent to the subapical cross vein. The pterostigma is medium brown with a distinctly darker brown somewhat trapezoidal spot at the base. The anterior cross vein is faintly infuscated on each side; the lower angles of the subapical and lower cross veins are without spurs, the third vein is very gently and slightly curved throughout but not sinuous.

Holotype: a female, La Visite vic La Selle Range, 5–7000 ft., Sept. 16, 1923, HAITI, 1934, M. Bates collector. *Paratype:* a female with the same data. Type in the Museum of Comparative Zoology.

Baccha harlequina n. sp.

A slender, delicate species with hyaline wings, brown pterostigma and bands or pairs of yellow spots upon the abdomen. Length 9.5 mm. Related to *argentina* Curran, but different in pattern.

Female. *Head:* the vertex is polished black, unusually convex, its black pile in two rows; the convexity ends in a little crease around the anterior margin of the ocelli. The front is shining black, prominently, transversely striate, the eye margins banded with sparse, white pubescence, the frontal pile erect and fine and white and short, the vertical pile black. The preantennal callus is yellow with a small cordate, black spot. The face and cheeks are light yellow with prominent tubercle, the facial pile white. The antennae are short, the first two segments pale brownish orange, the second rather considerably produced along the inner surface of the third although not in the form of a strap or spur. The third segment is orange below, dark brown

above, the arista blackish. The posterior eye margin is moderately indented in the middle, the pile of the occiput on the lower two-thirds is composed of unusually wide, flattened, scalose pile which is silvery white with a faint yellowish tinge. *Thorax:* the mesonotum is shining black, brassy to reddish in reflection along the sides and especially above the post calli; the lateral margins are light yellow. There are a pair of yellowish grey pollinose vittae and a slender median line of similar pollen on the black part of the mesonotum; the outer vittae are expanded in front of the scutellum into a rather wide quadrangle of pale brownish pollen, divided by a bare line in the middle. The scutellum is a pale subtranslucent brown; the margin is quite linearly yellowish brown pollinose; the pile on the surface is very minute, sparse and black and there is no ventral fringe. The pleura are subtranslucent and light yellow; the lower part of the sternopleura and the extreme posterior part of the metapleura are metallic blackish; the squamae are extremely short and light yellowish, the fringe reduced to three or four yellow hairs quite in the middle of the margin, the halteres pale yellow with dark brown knob, the mesonotum is covered with exceedingly short, sparse, black pile, the anterior margin without collar. *Abdomen:* slender, elongate and petiolate, the first segment shining brownish black, the anterior lateral corners narrowly light yellow with a tuft of long, fine yellow hairs. The second segment is ten to twelve times as long as its least width; it is brownish black and polished with a brownish yellow triangle on each side of the base and a narrow, complete yellow annulus just beyond the middle which expands laterally; also the lateral portion of the apical margin is narrowly yellow. The third segment is shorter; it is equally narrow on the basal half, expanding considerably posteriorly with a complete, pale yellow band at the base, a pair of narrowly separated, subquadrangular, pale yellow spots beginning just at the middle, the remainder of the segment black and shining. The fourth segment is shining black with a pair of quite large, subquadrate, narrowly separated pale yellow spots on the base of the segment; these spots extend almost to the middle of the segment. Fifth segment with a pair

of subtriangular, subbasal and sublateral, rather large, brownish yellow spots on the base of the segment; these spots are indented in the middle posteriorly and the outer section is produced somewhat posteriorly. Sixth segment entirely shining black. *Legs:* first four legs and the hind femora except for a wide, conspicuous sepia brown, post median band, all pale yellow. The hind tibiae are light yellow at base and apex, light brown in the middle, the brown area gathered into two slightly darker, narrow, submedial annulae; the hind tarsi dark brown on the dorsal surface with similarly colored pile; the pile of the hind tibiae and femora is extremely short and brownish to black. *Wings*: hyaline, the pterostigma is rather dark brown. The alula is absent on the basal portion of the wing, is narrow but quite short and lies opposite the costal cross vein and is confined to the area adjacent to the base of the anal vein.

Holotype: a female, Natal, BRAZIL, Oct. 8–20, 1943, F. M. Snyder. In the collection of Dr. C. L. Fluke. One paratype, Natal, Feb. 5–24.

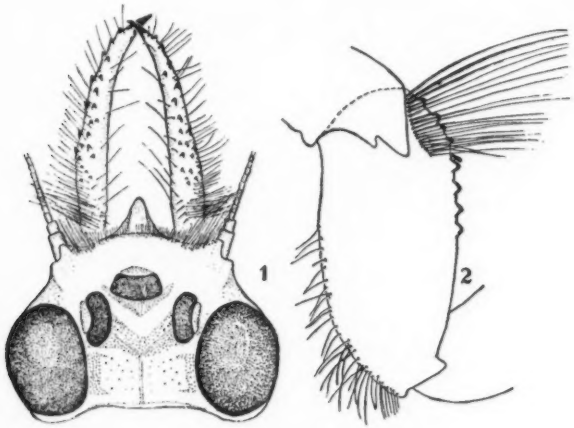
The Nymph of Ephoron album (Ephemeroptera)

By GEORGE F. EDMUNDS, JR., University of Utah

Two species of the mayfly genus *Ephoron* have been reported from North America, *E. leukon* Williamson and *E. album* (Say). Needham and Christenson (1927: 16) briefly described the nymph of *album* but the description is inadequate and will not serve to distinguish *album* from *leukon*, the nymph of which was described in detail by Ide (1935: 114). On August 20, 1947 the author and A. R. Gaufin obtained a series of forty nymphs of *album* from Jordan Canal near Sandy, Utah, many of which were in the last instar. For purposes of comparison the writer has samples of *leukon* from which Ide described the nymphs (Credit River, near Erindale, Ontario) and many specimens from Maryland and Virginia which were borrowed from Cornell University. In view of the inadequacy of the previous

description of the nymph of *album*, a redescription is given below together with a diagnosis of the characters which distinguish nymphs of *album* and *leukon*.

Nymph.—Size: male, body 17 mm., lateral tails 11, median tail 6; female, body 17, lateral tails 5, median tail 6. General color dull milky white with light purplish gray markings.



EPHORON ALBUM (Say)

Fig. 1. Dorsal view of head of last instar male nymph.
Fig. 2. Posterior view of front left femur of same.

Frontal process of head conical, hind margin concave or sinuate (fig. 1). Eyes and ocelli black. Mandibular tusks slightly longer than head capsule with about 21–25 golden brown tubercles and numerous long hairs on the dorso-lateral surface. Mesothorax milky white with gray wing pads in the last instar. Forelegs stout with several distinct rows of long hairs. Femur with a row of tubercles along the basal 50 per cent or more of the ventral edge (fig. 2). Middle and hind legs small and weak. Abdomen milky white with a black dot at the base of each gill. First gill small and narrowly triangular. Main tracheal trunk in gills 2–7 purplish gray, all other branches pale and indistinct.

Outer tails purplish gray, median one pale. Other characters as in the genus.

Diagnosis.—The following characteristics distinguish the late instar nymphs of *album* from those of *leukon*. About 21–25 tubercles on the mandibular tusks of *album*, about 28–34 in *leukon*. Tubercles on the fore-femur extend along the basal 50 per cent of the ventral edge in *album*, but only along the basal 40 per cent in *leukon*. The gills of *album* have only the main tracheal trunks pigmented while in *leukon* the branches as well as the tracheal trunk are pigmented.

Habitat.—Ide (op. cit.: 113) found that nymphs of *leukon* live in burrows of fine silt associated with rocks in the rapids of streams. The nymphs are apparently nocturnal and remain in the burrows during the day and feed at night. Nymphs of *album* were found at a depth of three to four feet in water carrying silt and fine clay. In the center of the stream the current had removed the clay and left a coarse sand bottom but along the edge where there is little current a fine lightly compacted clay-sand mixture had been deposited. The burrows which were one and one-half to two inches deep were abundant in this sediment. No rocks were found associated with the burrows. Collections were made with an Ekman dredge about 5:30 P. M. at which time the nymphs were found in the bottoms of the burrows with their heads toward the opening.

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Coreidae of South Carolina in Comparison with North Carolina (Hemiptera) *

By FRANKLIN SHERMAN, Clemson College, Clemson, S. C.

In our faunal studies this family has been given some attention; our state list shows 32 species as compared with 31 listed by Brimley in Insects of North Carolina and Supplement. Four species in the North Carolina list are not (yet) recorded in South Carolina while five are listed for South Carolina but not (yet) in North Carolina; 27 species are in both lists indicating close similarity in the faunas so far as this family is concerned.

We give the combined list: the four species not found in South Carolina are indicated by an asterisk. The more difficult species have been identified by such specialists as Messrs. Heideman, Barber, Sailer, Knight and Harris.

So far as observed by us, all of the species are herbivorous.

Merocoris typhaeus (Fabr.). Three scattered localities suggest statewide distribution; late-May to late-October.

M. t. var. *distinctus* (Dall.). Four localities suggest statewide; early-June to late-August.

Acanthocephala declivis (Say). Three localities in coastal plain; early-May, late-May, December.

A. femorata (Fabr.). Most of state, not yet taken in actual mountains; mid-April to mid-November.

A. confraterna (Uhl.). One coastal locality; late-October. (Not in the North Carolina list.)

A. terminalis (Dall.). Most of state, not yet from actual coast; late-March to December.

Leptoglossus phyllopus (Linn.). Statewide; late-March to December.

L. corculus (Say). Clemson only; mid-June, at light, probably through most of state.

* Technical Contribution No. 146 from the South Carolina Agricultural Experiment Station, Clemson, South Carolina.

The manuscript for this paper was found in Professor Sherman's desk after his death on June 23, 1947. It probably represents his last entomological contribution.—O. L. CARTWRIGHT.

L. oppositus (Say). Four localities suggesting statewide; early-March to December.

L. fulvicornis (Westw.). Two localities in coastal plain; late-May, early-November.

Mozena obesa Montandon. One locality in coastal plain; mid-April. (Not in the North Carolina list.)

Archimerus calcarator (Fabr.). Clemson and one coastal locality; mid-April and mid-August.

A. alternatus (Say). Statewide; although only two easterly localities, it is common in west; mid-April to mid-October.

Euthoctha galeator (Fabr.). Statewide; early-April to late-October.

* (*Corecorus diffusus* (Say). Listed for North Carolina; not yet recorded for South Carolina.)

Chariesterus antennator (Fabr.). Western two-thirds of state; early-April to December.

Chelinidea vittiger Uhl. Eastern half of state, associated with the wild prickly-pear cactus; mid-July to late-October.

Margus obscurator (Fabr.). One coastal-plain locality; late-May. (Not in the North Carolina list.)

Catorhintha guttula (Fabr.). One coastal locality (in North Carolina lists one locality in coastal plain); late-July.

Cimolus obscurus Stal. Van Duzee Catalogue credits it to South Carolina, no other record. (Not in North Carolina list.)

Anasa tristis (DeG.). Common squash bug, a pest. Statewide though no records from actual mountains; present throughout the year.

A. armigera (Say). Apparently statewide though not yet recorded from actual mountains; mid-June to mid-October.

Leptocorisa tipuloides (DeG.). Clemson; mid-July. (Not in North Carolina list.)

Megalotomus 5-spinosus (Say). Western part of state; early-June to mid-October.

Alydus eurinus (Say). Western two-thirds of state, records fewer to eastward; mid-May to late-October.

A. pilosulus H. S. Statewide; late-May to mid-November.

Stachyocnemis apicalis (Dall.). Only two localities but probably statewide; late-April to late-November.

* (*Coraleptus americanus* Stal. North Carolina. Not yet recorded from South Carolina.)

Harmostes reflexulus (Say). Western three-fourths of state; early-April to early-November, January.

* (*H. fraterculus* (Say). North Carolina. Not yet taken in South Carolina.)

Corizus hyalinus (Fabr.). Most of state, but not yet taken in actual mountains; late-August to late-November.

C. sidae (Fabr.). Most of state, chiefly eastward, not yet taken in mountains; mid-May to early-November.

C. lateralis (Say). Several scattered localities but not (yet) on coast; late-May to mid-November.

C. bohemanii Sign. Scattered localities in western half of state; early-April to mid-September.

Leptocoris trivittatus (Say). Box-elder bug. Western third of state; spring and autumn, often abundant invading houses in late season.

* (*Jadera haematoloma* (H. S.). North Carolina, not yet recorded in South Carolina.)

Notice

The Herbert H. Smith collection of South American Chalcidoidea containing the **Ashmead types** (Ashmead, W. H., *Memoirs of the Carnegie Museum*, Vol. I, No. 4, pt. 2, 1904) has been acquired from the Carnegie Museum by the United States National Museum.

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Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South) including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

List of Titles of Publications Referred to by Numbers in Entomological Literature in Entomological News.

1. American Midland Naturalist. Notre Dame, Indiana.
2. American Museum Novitates. New York, N. Y.
3. American Naturalist. Garrison-on-Hudson, New York.
4. Annals of Applied Biology. London.
5. Annals of the Entomological Society of America. Columbus, Ohio.
6. Annals and Magazine of Natural History. London.
7. Annales Academia Brasileira Sciencias. Rio de Janeiro.
8. Anales del Instituto de Biologia Mexico. Mexico City.
9. Anatomical Record. Philadelphia.
10. Arkiv för Zoologie. K. Svenska Vetenkapsakademien i. Stockholm.
11. Arquivos de Higiene e Saude Publica. São Paulo.
12. Biological Bulletin. Woods Hole, Massachusetts.
13. Bios, Rivista Biol. Geneva.
14. Boletin de Entomologia Venezolana. Caracas.
15. Boletin del Museo de Historia Natural "Javier Prado." Lima, Peru.
16. Boletin do Museu Nacional do Rio de Janeiro. Brasil.
17. Bull. Acad. Sci. (Izvestia Akad. nauk) U R S S (S. biol.).
18. Bulletin of the Brooklyn Entomological Society. New York.
19. Bulletin of Entomological Research. London.
20. Bulletin of the Museum of Comparative Zoology. Cambridge, Mass.
21. Bulletin of the Southern California Acad. of Sciences. Los Angeles.
22. C. r. Acad. Sci. (Doklady Akad. nauk) U R S S. Leningrad.
23. Canadian Entomologist. Guelph, Canada.
24. Canadian Journal of Research. Ottawa, Canada.
25. Ecological Monographs. Durham, North Carolina.
26. Ecology. Brooklyn, New York.
27. Entomologica Americana. Brooklyn Ent. Society, New York.
28. Entomological Monthly Magazine. London.
29. Entomological Record and Journal of Variations. London.
30. The Entomologist. London.
31. Florida Entomologist. Gainesville, Florida.
32. Frontiers. Philadelphia, Pennsylvania.
33. Great Basin Naturalist. Provo, Utah.
34. Iowa State College Journal of Science. Ames, Iowa.
35. Journal of Agricultural Research. Washington, D. C.
36. Journal of Animal Ecology. London.
37. Journal of Economic Entomology. Geneva, New York.
38. Journal of the Elisha Mitchell Science Society. Chapel Hill, N. C.
39. Journal of Entomology and Zoology. Claremont, California.
40. Journal of Experimental Biology. London.
41. Journal of Experimental Zoology. Philadelphia, Pennsylvania.
42. Journal of Heredity. Baltimore, Maryland.
43. Journal of the Kansas Entomological Society. Lawrence, Kansas.
44. Journal of Morphology. Philadelphia, Pennsylvania.
45. Journal of the New York Entomological Society. New York.
46. Journal of Parasitology. New York.
47. Journal of the Tennessee Academy of Sciences. Nashville, Tenn.
48. Journal of the Washington Academy of Sciences. Washington, D. C.
49. Memorias do Instituto Oswaldo Cruz. Rio de Janeiro.
50. Microentomology. Stanford University, California.
51. The Microscope and Entomological Monthly. London.
52. Mosquito News. Albany, New York.
53. Nature. London.
54. Nature. Washington, D. C.
55. La Naturaliste Canadien. Quebec.

56. Natural History. New York.
57. Occasional Papers, Mus. of Zool., Univ. of Michigan. Ann Arbor.
58. Ohio Journal of Science. Columbus, Ohio.
59. Opinions and Declarations. Intern. Com. Zool. Nomencl. London.
60. Pan-Pacific Entomologist. San Francisco, California.
61. Parasitology. London.
62. Proceedings of the Academy of Natural Sciences. Philadelphia.
63. Proceedings of the Biol. Soc. of Washington. Washington, D. C.
64. Proceedings of the California Academy of Sciences. San Francisco.
65. Proceedings of the Entom. Soc. of Washington. Washington, D. C.
66. Proceedings of the Hawaiian Entomological Society. Honolulu.
67. Proceedings of the National Acad. of Sciences. Washington, D. C.
68. Proceedings of the Royal Entomological Society of London. Ser. A.
69. Proceedings of the Royal Entomological Society of London. Ser. B.
70. Proceedings of the Royal Entomological Society of London. Ser. C.
71. Proceedings of the U. S. National Museum. Washington, D. C.
72. Proceedings of the Zoological Society of London. London.
73. Psyche, A Journal of Entomology. Boston, Massachusetts.
74. Quarterly Journal of Microscopical Science. London.
75. Quarterly Review of Biology. Baltimore, Maryland.
76. Revista Academia Columbiana de Cien. Exact. Fis. y Nat. Bogotá.
77. Revista Chilena de Historia Natural. Valparaiso, Chile.
78. Revista Instituto Salubridad y Enfermedades Tropicales. Mexico.
79. Revista Sociedad Mexicana de Historia Natural. Mexico City.
80. Science. Washington, D. C.
81. Scientific Monthly. New York.
82. Smithsonian Miscellaneous Collections. Washington, D. C.
83. Transactions of the American Entomological Society. Philadelphia.
84. Transactions of the Amer. Microsc. Soc. Menasha, Wisconsin.
85. Transactions of the Illinois State Academy of Sciences. Springfield.
86. Transactions of the Kansas Acad. of Sci. Manhattan, Kansas.
87. Transactions of the Royal Canadian Institute. Toronto.
88. Transactions of the Royal Entomological Society. London.
89. U. S. Dept. of Agric., Farmer's Bulletins. Washington, D. C.
90. U. S. Dept. of Agric., Technical Bulletins. Washington, D. C.
91. University of California Publications in Entomology. Berkeley.
92. University of California Publications in Zoology. Berkeley.
93. University of Kansas, Science Bulletins. Lawrence, Kansas.
94. Ward's Natural Science Bulletin. Rochester, New York.
95. Zoologica. New York.
96. American Journal of Public Health. Boston.
97. American Journal of Tropical Medicine. Baltimore.
98. Annals of Tropical Medicine and Parasitology. Liverpool.
99. Canadian Journal of Research. Section E, Medical Sciences, Ottawa.
100. Evolution. New York.
101. Mitteilungen der schweitzerischen entomologischen Gesellschaft, Bern.
102. Revue de Entomologie. Rio de Janeiro, Brasil.
103. Proceedings of the Royal Society of London.
104. Anales de la Escuela Nacional de Ciencias Biologicas. Mexico.
105. Journal of Cellular and Comparative Physiology. Philadelphia.
106. Redia. Florence, Italy.
107. Annales de la Société Entomologique de France. Paris.
108. Bulletin de la Société Entomologique de France. Paris.
109. Notulae Naturae. Philadelphia.
110. L'Entomologiste. Paris.
111. Revista Brasiliera de Biologie. Rio de Janeiro.
112. Eos, Revista Española de Entomologia. Madrid.
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ANATOMY, PHYSIOLOGY, MEDICAL—Bailey, W. S.—Observations on the rôle of Tenebrio molitor as an intermediate host for Hymenolepis nana var. fraterna (tapeworm). [46] 36: 433–34. **Bauer, H.**—Gekoppelte Vererbung bei Phryne fenestralis und die Beziehung zwischen Faktorenaustausch und Chiasmabildung (Dipt.). [Biol. Zentralblatt] 65: 108–15 (1946). **Beck and Miles**—Some theoretical and experimental relationships between infrared absorption and olfaction. (Nat. Acad. Sci., abstract.) [80] 106: 511. **Bock, E.**—Wechselbeziehungen Zwischen den Keimblättern bei der Organhildung von Chrysopa perla (L.). I. Die Entwicklung des Ektoderms in Mesodermdefekten Keimteilen. [Roux' Arch. Entwicklungsmech.] 141: 159–247 (1941). **Brundin, L.**—Zur Kenntnis einiger in die Atheta-untergattung Metaxya M. & R. gestellten Arten (Staphylinidae). [Lunds Universitets Arsskrift. N. F.] Avd. 2, Bd. 39, Nr. 4: 1–38, ill. **Buck and Keister**—Physiological studies on the mechanism of action of DDT in insects. [12] 93: 189–90. **Burbanck, W. D., Edwards, J. P., and Burbanck, M. P.**—Toleration of lowered oxygen tension by cave and stream crayfish. [12] 93: 190. **Butenandt, Karlson and Hannes**—Über den "Anti-Bar-Stoff," einen genabhängigen, morphogenetischen Wirkstoff bei D. melanogaster. [Biol. Zentralbl.] 65: 41–51 (1946). **Campana, Y.**—Schizomelies spontanées et expérimentales chez les Ixodoidea. [Annales de Parasit.] 22: 53–62. **Danneel, R.**—Melaninbildende Fermente bei Drosophila melanogaster. II. Nachweiss einer Dehydrase Neuformulierung der Tyrosinase-Tyrosin Reaktion. [Biol. Zentralbl.] 65: 115–19 (1946). **Dowdy, W. W.**—An ecological study of the Arthropoda of an oak-hickory forest with reference to stratification. [26] 28: 418–39. **Ferris, G. F.**—The contradictions of the insect head. [50] 12: 59–64. **Finney, Flanders and Smith**—Mass culture of

Macrocentrus ancylivorus and its host, the potato tuber moth. [Hilgardia] 17: 437–83. **Ford, E. B.**—A murexide test for the recognition of pterins in intact insects. [68] 22: 72–76.—Studies on the chemistry of pigments in the Lepidoptera with reference to their bearing on systematics. 5. P. paradoxa. *Ibid.*: 77–78. **Ford, R. L. E.**—The use of common salt for keeping down vegetable and other moulds during breeding experiments. [68] 22: 86–88. **Galliard, H.**—Évolution de Wuchereria bancrofti et W. malayi chez Aëdes (Stegomyia) aegypti et A. (S.) albopictus. [Annales de Parasit.] 22: 30–35. **Hadorn and Zeller**—Fertilitätsstudien an D. melanogaster. I. Untersuchungen zum alters bedingten Fertilitätsabfall. [Roux' Arch. Entwicklungsmech.] 142: 276–300 (1942). **Hartung, E. W.**—Some effects of temperature on tumor incidence in several strains of D. melanogaster. [41] 106: 223–32. **Hayes, W. P. and Liu, Yu-Su**—Tarsal chemoreceptors of the housefly and their possible relation to DDT toxicity. [5] 40: 401–16. **Henke, K.**—Über die Verschiedenen Zellteilungsvorgänge in der Entwicklung des beschuppten Flügelepithels der Mehlmotte Ephestia kühriella. [Biol. Zentralbl.] 65: 120–35 (1946). **Henry, L. M.**—The nervous system and the segmentation of the head in the Annulata. [50] 12: 65–82. **Herbst, C.**—Die Bedeutung der Salzversuche für die Frage nach der Wirkungsart der Gene. Zusammensehau einer Hydratations-bzw. Mikrolaboratorien—bautheorie der Genwirkungen. [Roux' Arch. Entwicklungsmech.] 142: 319–781 (1942). **Homann, H.**—Über die Jugendform von Micrommata viridissima (Araneae). [Biol. Zentralblatt] 65: 82–83 (1946). **Judd, W. W.**—The proventricular region of Machilis variabilis (Thysanura). [24] 25 (D): 135–38, ill. —The proventriculus of Macrobasis unicolor (Meloid). [5] 40: 518–21. **Kühn and An (*nee* Engelhardt)**—Elektronenoptische Untersuchungen über den Bau von Schmetterlings-schuppen. [Biol. Zentralbl.] 65: 30–40 (1946). **Leclercq, J.**—Influence de l'humidité sur la survie de quelques coleoptères adultes. [Annales de la Societé Royale Zool. Belgique] 77: 48–55. **Leone, C. A.**—A serological study of some Orthoptera. [5] 40: 417–33. **Mendes, M. V.**—Glandulas endocrinas e hormonio nos Insetos. [Anais da Acad. Bras. de Ciencias] 19: 259–75. **Miles and Beck**—Infrared absorption in field studies of olfaction in bees. (Nat. Acad. Sci., abstract.) [80] 106: 512. **Munson and Yeager**—The relation between poison concentration and survival time of roaches injected with sodium and potas-

sium cyanides and potassium ferricyanide. [5] 40: 475–88. **Needham, A. E.**—Sensitivity of regenerating limbs of an aquatic crustacean to variations in the concentration of hydrogen and phosphate ions in the external medium. [41] 106: 181–95. **Palm, N. B.**—Structure and physiology of the stink glands in Tribolium destructor. [Opuscula Entom., Lund] 11: 119–32, ill. **Piepho, H.**—Untersuchungen zur Entwicklungs physiologie der Insekten metamorphose. Über die Puppenhäutung der Wachsmotte Galleria mellonella. [Roux' Arch. Entwicklungsmech.] 141: 500–583, ill. (1941).—Versuche über die Rolle von Wirkstoffen in der Metamorphose der Schmetterlinge. [Biol. Zentralblatt] 65: 141–48 (1946). **Possompes, B.**—Les glandes endocrines post-cerebrals des Diptères. II. Etude sommaire des corpora allata et des corpora cardiaca chez la larva de Tipula sp. [Bull. Soc. Zool. France] 72: 57–62, ill. **Sanford, K. K.**—The effect of temperature on the intersex character of Daphnia longispina. [Physiol. Zool.] 20: 325–32. **Stone, F. L.**—The problem of differences of offspring in reciprocal crosses of Drosophila. [12] 93: 102–11. **Sung-Yün Ma**—Experimentelle Untersuchungen über Hitzemodificationen des Flügels von Drosophila melanogaster. [Roux' Arch. Entwicklungsmech.] 142: 508–618, ill. (1943) **Villee, C. A.**—Studies of the metabolism of normal and mutant imaginal discs of Drosophila. [12] 93: 228. **Villee, C. A. and Bissell, H. B.**—Nucleic acids as growth factors in Drosophila. [12] 93: 213. **Vogt, M.**—Induktion von Metamorphose prozessen durch implantierte Ringdrüsen bei Drosophila. [Roux' Arch. Entwicklungsmech.] 142: 121–30 (1942).—Weiteres zur Frage der Artspezifität gonadotroper Hormone. Untersuchungen an Drosophila-Arten. *Ibid.*: 141: 424–554, ill. (1941). **Waterhouse, D. F.**—Studies of the physiology and toxicology of blowflies. [Comm. of Australia, Council for Sci. and Ind. Research] Bull. 218: 1–30. **Weber, N. A.**—Binary anterior ocelli in ants. [12] 93: 112–13. **Whiting, P. W.**—Spermatogenesis in sphecoid wasps. [12] 93: 218. **Wigglesworth, V. B.**—The site of action of inert dusts on certain beetles infesting stored products. [68] 22: 65–69. **Williams, C. M.**—Physiology of insect diapause. II. Interaction between the pupal brain and prothoracic glands in the metamorphosis of the giant silkworm, Platysamia cecropia. [12] 93: 89–98.

ARACHNIDA AND MYRIOPODA—Campana, Y.—(See under Anatomy.) **Chamberlin, R. V.**—A new myr-

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ORTHOPTERA—Hayes and Liu—(See under Anatomy). **Knoulton, G. F.**—Two mantids from Utah. [18] 42: 86. **Leone, C. A.**—(See under Anatomy.) **Liebermann, J.**—"Nahuelia rubriventris, nuevo genero y nueva especie Argentina del Grupo "Jivari" (Cyrtacanth.). [Anales del museo Argentino de Cien. Nat.] 50: 303–12, ill. **Miner, F. D.**—Injury to raspberry by a meadow grasshopper. [43] 20: 86–87. **Munson and Yeager**—(See under Anatomy.) **Princis, K.**—Drei neue neotropische Blattodeen. [Kungl. Fysiografiska Sallskapets 1 Lund Forhandlingar] 16: (17): 1–8, ill.—Colombianische Blattodeen, gesammelt von Herrn G. Dahl und Frau M. Althen-Dahl in den Jahren 1936–1939. [*Ibid.*] 16: (16:) 1–15. **Roberts, H. R.**—Revision of the Mexican Melanoplini. [62] 99: 201–30, ill. (k*).

HEMIPTERA—DeLong, D. M.—A new genus Usanus and new species of Mexican leafhopper related to Chlorotettix. [60] 23: 110–11, ill. **DeLong and Hershberger**—A new genus (Crassana), new subgenus (Macrasana) and

new species of North American Leafhoppers (Cicadellidae). [60] 23: 76–78, ill. **DeLong, D. M. and Hershberger, R. V.**—A new genus and species of leafhopper from Central America related to Atanus (Ciccadellid). [65] 49: 231–32. **Drake and Poor**—Four new Tingitidae from Argentina. [Anales del museo Argentino de Cien. Nat.] 50: 299–302 (*). **Essig, E. O.**—A new aphid on Pentstemon in the Sierra of California. [60] 23: 97–100, ill. **Fennah, R. G.**—Notes on neotropical Dictyopharidae and synonymy in two other groups. [82] 107: 11: 1–13, ill (*). **Ferris and Rao**—The genus Pinnaspis (Diaspid). [50] 12: 25–58 (k). **Ferris, G. F.**—The genus Pinnaspis Cockerell (Diaspididae). [50] 12: 25–58, ill. (k). **Knowlton, G. F.**—A new hollyhock aphid. [60] 23: 137–40. **Knull and Knull**—Two new Amycle (Fulgorid). [5] 40: 397–400. **Nye, W. P.**—A simple method of mounting Aphids. [60] 23: 73–74. **Oman, P. W.**—A contribution to the classification of S. Amer. Agallian leafhoppers. [Annals of Carnegie Mus.] 25: 351–460, ill. (k*). **Usinger, R. L.**—Native hosts of the Mexican chicken bug, Haematosiphon inodora (Duges). [60] 23: 140. **Tuthill, L. D.**—Three new Psyllids from Costa Rica. [60] 23: 141–44, ill.

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REVIEW

THE BLOWFLIES OF NORTH AMERICA, by David G. Hall. Pages v + 477, 5 color plates, 46 plates, 9 text figures. Published by the Thomas Say Foundation of the Entomological Society of America. Printed by the Monumental Printing Co., Baltimore, Md., January, 1948. Price, $6.50. Obtainable from Prof. J. J. Davis, Purdue University, Lafayette, Ind.

This attractively bound, monographic revision of the North American blowflies is a work of such comprehensive treatment that it will be a standard and necessary manual for workers in the fields of medical and veterinary entomology and public health, as well as for general entomologists and biologists. The current interest in the potential role of these common flies in the epidemiology of poliomyelitis further enhances the timeliness and value of the book.

This is the fourth of a series of important entomological books sponsored by the Thomas Say Foundation. Earlier volumes appeared in 1916, 1925, and 1931.

The introductory portion occupies approximately forty pages in which the author discusses, in an easily readable style, the history of the classification of blowflies, their importance to man (with particular attention to disease relationships and myiasis), control methods, techniques for collecting and studying blowflies, terminology, and variation. The remainder of the volume is an unusually complete taxonomic revision, with a detailed and illustrated account of both external and internal anatomy of male and female genitalia, and of the larval anatomy, keys to the adults and to the mature larvae as far as known, detailed descriptions of the 27 genera and 83 species recognized from North America, fully documented synonymy, descriptions of all known immature stages, and comments under each species on distribution, taxonomic relationship, biology, and economic importance. The section on "Literature Cited," which contains biological references cited in the text, lists slightly over 300 titles. The completely cross referenced index of eleven pages should enable one to locate any generic or specific name or combination that has been used for North American flies of this family.

One feature of this volume which will certainly insure the work a permanent place in entomological literature is the wealth of illustrations. All plates, figures, and photographs are the work of the author himself. They are a monument to his industry and ability. Opinions may differ on generic classification or on the validity of some of the differentiating characters, but the tremendous labor involved in preparing so many excellent illustrations of both adults and larvae must command admiration.

Attention should particularly be called to three important and far-reaching changes in familiar names: (1) the explanation of the adoption for the American screwworm flies of the generic name *Callitroga* instead of *Cochliomyia* (cf. "Common Names of Insects Approved by the American Association of Economic Entomologists," Jour. Econ. Ent. 39: 435, 439, 1946), (2) the proposal of a new generic name (*Apaulina*) for the American bird nest screwworm flies that have hitherto been called *Protocalliphora,* (3) the use of *Phaenicia* for most of the greenbottle flies usually called *Lucilia,* the latter name being restricted in this country to a single species, *L. illustris,* and (4) the use of *Calliphora vicina* R.D. for the common bluebottle fly that has long been known as *Calliphora erythrocephala* (Meigen). *Lucilia caesar,* one of the commonest species cited in the American literature, is said not to be known to occur in North America.—CURTIS W. SABROSKY.

NOTICE. The December 1947 issue of ENTOMOLOGICAL NEWS was mailed at the Post Office at Lancaster, Pa. on February 10, 1948.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

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